

Michael J. Elmore
Wyoming State Bar No. 7-5665
Assistant United States Attorney
District of Wyoming
P.O. Box 668
Cheyenne, WY 82003
(307) 772-2124
michael.elmore@usdoj.gov

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF WYOMING**

UNITED STATES OF AMERICA,

Plaintiff,

v.

Criminal No. 22-CR-60-F

RONALD OSTROM,

Defendant.

**GOVERNMENT'S SUPPLEMENTAL NOTICE OF INTENT TO OFFER
EXPERT TESTIMONY PURSUANT TO RULE 16(a)(1)(G)**

The United States of America hereby submits its notice of intent to offer expert testimony at trial in this matter. Fed. R. Crim. P. 16(a)(1)(G).

Dr. Sarah Schreiber – Veterinarian

Dr. Sarah Schreiber was previously designated as an expert in this matter (ECF Doc. 31) however the government did not have her curriculum vitae at the time of filing. Ms. Schreiber's curriculum vitae is now attached hereto.

Gary Zakotnik-Brand Supervisor, Wyoming Livestock Board Investigator

In addition to Mr. Zakotnik's expected testimony which was previously detailed in the government's notice of expert testimony (ECF Docs. 10 & 31), Mr. Zakotnik will provide testimony as to the potential value of horses and mules. Mr. Zakotnik will testify that based on his

training and experience, the value of horses and mules will vary due to pedigree, build or “conformation,” and ability to complete desired tasks. One can expect to pay more for horses with conformation desirable for an intended purpose. One would expect to pay more for a horse already trained to complete a task than one that will require time and expense to reach that point. Mr. Zakotnik will provide a rough basis for determining the potential monetary value of the livestock involved in this case based on his training, experience and livestock market prices.

Crosby Davidson-Lead Packer for the Shoshone Pack String, USFS

Crosby Davidson is the lead packer for the Shoshone National Forest pack string and will provide testimony as to the government contracting process for buying livestock for use in the Forest Service law enforcement capacity. Mr. Davidson will testify that based on his training and experience the current cost for horses and mules which are suitable for use in law enforcement and for use in the back country is approximately \$5000-\$7000. Mr. Davidson will further testify that based on his training and experience, the value of horses and mules will vary due to pedigree, build or “conformation,” and ability to complete desired tasks. One can expect to pay more for horses with conformation desirable for an intended purpose. One would expect to pay more for a horse already trained to complete a task than one that will require time and expense to reach that point.

Robert Grahn/Rebecca Bellone--Horse Color Genetics—UC Davis, Veterinary Genetic Laboratory

Forensic Analyst's Grahn and/or Bellone will testify regarding their testing, comparisons, results and conclusions regarding the horse coat color/pattern test reports for the mare known as Roany and the mare known as Lulu. The reports which contain the findings and conclusions of this testing has been turned over to the defense in the discovery process. It is further anticipated the analyst may testify that the gray color gene in horses causes progressive depigmentation of the

hair, often resulting in a coat color that is almost completely white by the age of 6-8 years. Horses that inherit progressive gray genes can be born any color, then begin gradually to show white hairs mixed with the colored throughout the body. Usually the first signs of gray hair can be found on the head, particularly around the eyes. The gray gene is dominant; therefore a single copy of the gray allele will cause a horse to turn gray. Analyst Grahn's curriculum vitae is attached; Ms. Bellone's curriculum vitae will be provided upon receipt.

CONCLUSION

The government requests that the Defendant disclose, in writing, any expert testimony the Defendant intends to offer at trial in this matter. Fed. R. Crim. P. 16(b)(1)(C)(i). Further, the government reserves the right to supplement this notice pursuant to its continuing duty to disclose. Fed. R. Crim. P. 16(a)(1)(G)(vi). Investigations in criminal cases are ongoing and additional evidence may be discovered, requiring additional expert witness testimony.

Respectfully submitted this 23rd day of October, 2023.

NICHOLAS VASSALLO
United States Attorney

By: /s/ Michael J. Elmore
MICHAEL J. ELMORE
Assistant United States Attorney

CERTIFICATE OF SERVICE

This is to certify that on the 23rd day of October 2023, I served a true and correct copy of the foregoing **Government's Supplemental Notice of Intent to Offer Expert Testimony Pursuant to Rule 16(a)(1)(G)** upon counsel of record by electronic filing.

/s/ Mikala Dawson
UNITED STATES ATTORNEY'S OFFICE

SARAH SCHREIBER, DVM

Sarahsdvm92@gmail.com
1650 Commercial Avenue, Sheridan, WY 82801
(307)672-5533

EDUCATION

1996-2000 Colorado State University	Doctor of Veterinary Medicine
1992-1996 Montana State University	Animal Science

EXPERIENCE

MOXEY SCHREIBER VETERINARY HOSPITAL

1650 COMMERCIAL AVE, SHERIDAN, WY 82801

2006 – Present – Practice Owner

Manage daily business operations of clinic

Practice veterinary medicine and surgery on large and small animals

MOXEY SCHREIBER VETERINARY HOSPITAL

1650 COMMERCIAL AVE, SHERIDAN, WY 82801

2000 - 2006 Veterinary Associate

Practice veterinary medicine and surgery on large and small animals

SKILLS

- WYO Winter Rodeo Board Member and Veterinarian
 - FEI Permitted Treatment Veterinarian
 - Sheridan WYO Rodeo Board Member and Veterinarian
 - Montana State University College Rodeo Team
- Skijoring Veterinarian
Endurance Treatment Veterinarian

June 2023

CURRICULUM VITAE

Robert A. Grahn

Lab Address:

980 Old Davis Road
Veterinary Genetics Laboratory
University of California, Davis
Davis, CA 95616
Email: ragrahn@ucdavis.edu
Ph: (530) 754-4378

Education:

Ph.D.	Biology	2004	University of Idaho, Moscow, Idaho
B.S.	Zoology	1991	University of California, Davis, California

Positions:

Associate Director of Services/Academic Administrator V: Veterinary Genetics Laboratory,
University of California, Davis. March 1, 2020-present

Associate Director of Test Development: Veterinary Genetics Laboratory, University of
California, Davis. March 2018-present

Forensic Analyst-Technical Reviewer: Veterinary Genetics Laboratory, University of California,
Davis. December 2015-present.

Associate Director: VGL Services.

Service: Direct/Manage the daily operations of the service aspect of the Veterinary Genetics Laboratory. Manage and oversee all service activities related to sample receiving, sample prep, PCR benchwork, genotyping, analysis and forensic testing, implementing plans to improve service efficiency. Represent VGL operations in regularly held general laboratory meetings as well as management meetings. Responsible for the cost effectiveness of testing, the efficiency of the genotyping and forensics workflow including both samples and results. Provide expertise in genetics and genomic analyses. Consult on cases that represent parentage exclusions, complex forensics cases or unforeseen legal disputes by reviewing files and testifying as necessary. Work with external organized entities such as breed clubs, registries, etc. to establish service-based contracts. Participate in appropriate professional societies and educational organizations, including committees. Assist IT in the specification of new software and modifications to existing software to meet the needs of the unit. Ensure that function descriptions and UC position descriptions are updated as appropriate. Maintain professional contact through meeting attendance or serving on local, state or national boards and committees in both the forensic science field and animal genetics.

Forensics: Direct/Manage the activities of Forensic Analysts, Forensic Scientists and the forensic testing Technical Leader, providing feedback during the annual performance appraisals of all personnel. Review Testimony Surveys with forensic testing personnel. Assign personnel to train new hires with forensic testing responsibility. In cases where retraining is necessary, determine a retraining program for forensic testing personnel.

Individually evaluate proficiency test work from each Forensic Scientist, Forensic Analyst and Technician, compile summarized laboratory results and submit the summary to the test provider. Lead and plan Weekly Forensics Staff Meetings. Moderate the Forensics Message Board and Teams channel. Prepare discovery documentation in preparation for trial.

Test Development. Direct/Manage the daily operations of the test development unit of the VGL. Identify areas for new tests development, assign and manage the work-flow of test development personnel, design novel assays, integrate said assays into current platforms (AB 3730, MassArray mass spectroscopy, droplet digital PCR, whole genome amplification, Sanger sequencing, and genotyping by sequencing), and work with the service team to deploy new tests. Establish timelines and targeted numbers of new test releases per year. Aim to diversify the base of tests offered by the VGL across species and client groups. Test data results will be used to determine allelic frequencies across breeds, shifting population frequencies and efficacy of genetic testing within and between breeds for mutation eradication. Collaborate with external researchers to facilitate funded research objectives. Liaise with foreign and domestic commercial and private research institutions to license patented tests for commercial development. Conduct primary research to develop novel commercial tests of interest to the VGL. Investigate new platforms for large-scale data production. Represent the VGL at professional meetings and conferences. Conduct primary research for test development and validation of domestic animal resources as required by the accrediting body in support of the VGL Forensics unit.

Forensic Analyst/Technical Reviewer. Forensic case analyst and technical reviewer of case work/reports. The forensic analyst completes secondary review of all data generated for casework, directs the workflow of the Forensic Scientist, completes data analysis and interpretation of case data including database searches and statistical analyses, and writes reports and conclusions for dissemination to the clients. The technical reviewer evaluates completed case-work prior to submission to the client, verifying concordance of tests, data, and reports, appropriateness of lab work for requested testing and conclusions of the analyst. Additional forensic responsibilities include conducting primary forensic research, attending scientific meetings, publishing data in peer-reviewed journals, mentoring graduate students in UC Davis Masters of Forensic Science program, attending regular unit meetings and completing an annual proficiency test.

Adjunct Faculty. Department of Science and Mathematics, Cosumnes River College, Elk Grove California, January 2016– present

Duties. Instructor for lecture and lab for Introductory Biology and Introduction to Anatomy and Physiology for non-majors. These are introductory courses that satisfy the requirements for transfer to four-year institutions. I design and provide all lecture and lab recitations within the given content parameters required for transfer.

Associate Director of Service: Veterinary Genetics Laboratory, University of California, Davis. July 1, 2019-2/2020 (Duties above)

Associate Professional Researcher: Veterinary Genetics Laboratory, University of California, Davis. February 2013-2019.

Duties: Developed tests of commercial interest to expand the portfolio offered by the VGL

Project Scientist IV: Department of Population Health and Reproduction, University of California, Davis. September 2005 to February 2013

Duties: Identification and generation of molecular markers for genetic traits in domestic cats (both inherited diseases and phenotypic traits). Genome-Wide Association Studies using SNP array technologies. Generation of data in support of Federal grant (Mapping resources of the domestic cat). Generation of data for submission to peer reviewed journals and meeting presentations. Writing of manuscripts for submission to peer reviewed journals. Writing grants. Training and supervising undergraduate students, graduate students and staff research assistants in standard molecular biology techniques including; DNA isolation, RNA isolation, PCR, gel electrophoresis, sequencing, sequence data analysis and cloning. Establishing collaborations with faculty members. Development of new assays applicable to current and future research in our lab. Primary cell culture. Large insert library screening and cDNA library generation.

Adjunct Faculty. Department of Science, Solano Community College, Fairfield, California January-May 2013

Duties. Instructor for lecture and lab for introductory biology. This is a 4 unit course and satisfies the requirements for transfer to 4 year institutions. I provided all lecture and lab recitations, presented course material and designed lectures within given content parameters required for transfer.

Post Graduate Researcher IV/Staff Research Associate III: Genetics and genomics of the domestic cat (*Felis catus*). Department of Population Health and Reproduction, University of California, Davis. November 1999 to August 2005.

Duties: Identification and generation of molecular markers for genetic traits in domestic cats (both inherited diseases and phenotypic traits). Marker mapping in multi-generational pedigrees. Generation of data in support of Federal grant (Mapping resources of the domestic cat). Generation of data for submission to peer reviewed journals and meeting presentations. Writing of manuscripts for submission to peer reviewed journals. Training and supervising, undergraduate and graduate students. Development of new assays applicable to current and future research in our lab.

Graduate Research Assistant: Molecular systematics of rodents. Department of Biological Sciences, University of Idaho, Moscow. September 1994 to November 1999.

Dissertation Title: Evolutionary dynamics of LINE-1 transposable elements in rodents

Graduate Teaching Assistant: Introductory Biology and Invertebrate Zoology. Department of Biological Sciences, University of Idaho, Moscow. September 1996 to June 1997.

Post Graduate Researcher I: Feline Immunodeficiency virus (FIV) characterization. Department of Veterinary Medicine and Epidemiology, University of California, Davis. June 1991 to September 1994.

Professional Affiliations

Society for Wildlife Forensic Science (2015)

California Association of Criminalists (2015)

International Society of Animal Genetics (2016)

Service

International Society of Animal Genetics standing committee: Companion Animal Genetics and Genomics (2016-2024)

International Society of Animal Genetics standing committee: Canine and Feline Comparison Test (2019-2027)

National Institute of Standards and Technology (NIST) Organization of Scientific Area Committees for Forensic Science (2016-2024)

Training received

Presentation of DNA Evidence in Court. 2014. California Department of Justice, Bureau of Forensic Services, California Criminalists Institute, Richmond, CA.

Continuing Education, 2014. California Association of Criminalists, Rohnert Park, CA.

Technical Writing for Criminalists. 2015. California Association of Criminalists, Burlingame, CA.

Continuing Education, 2015. California Association of Criminalists, Burlingame, CA.

Genomics-Wildlife Forensics and Next Generation Sequencing: The Next Technological Frontier Workshop. 2015. Society for Wildlife Forensic Science, Missoula MT.

Forensic Science and Animal Abuse Workshop, 2015. Society for Wildlife Forensic Science, Missoula MT.

Continuing Education, 2018. California Association of Criminalists, Concord, CA.

Bioinformatics Variant Analysis Workshop. August 27-31, 2018. UC Davis

Certification

Forensic Analyst –Veterinary Genetics Laboratory, Forensic Unit CA

Technical Reviewer –Veterinary Genetics Laboratory, Forensic Unit CA

Testimony

Qualified as an Expert Witness-Butte County, California, 2016. State of California vs. Michael Danny Scott, CM043699

Qualified as an Expert Witness-County of San Francisco, California, 2018. 18002375

Qualified as an Expert Witness-District of Oregon, Medford Oregon, USA vs Rodvelt, 2023

Qualified as an Expert Witness-Frederick County Commonwealth, Virginia, USA Commonwealth of Virginia vs. Bhagavan Antle 2023

Courses

Forensics: Animal DNA in Criminal Investigations. Southwestern Association of Forensic Scientists. Designed and presented a 4 hour training course for Forensics Scientists at the 40th Annual SWAFS Conference, October 3, 2018 Shreveport, LA.

Active Grants

PI: Robert A. Grahn. Paul Coverdell Forensic Science Improvement Grant-Subaward \$52,033 4/30/22-6/1/2023.

PI: Danika Bannasch, Co-PI: Robert Rebhun, Peter Dickinson, Daniel York, Robert Grahn Development of tools for evaluation of canine LINE-1 (Long Interspersed Nuclear Element 1) activity. Center for Companion Animal Health, UC Davis. \$14,990. /1/2022-7/31/2023

PI: Robert A. Grahn. Paul Coverdell Forensic Science Improvement Grant-Subaward \$51,957. 4/30/23-6/1/2024.

PI: Hasan Al-haddad, Co-PI: Robert Grahn. Identifying the genetic determinants of the differences in dromedary camel coat color using the candidate gene approach The Research Sector, Kuwait University. \$484,108.

Publications:

1. Pedersen NC, Griffey SM, Grahn R, and Munn R. (1993). A transmissible

- myocarditis/diaphragmatis of cats manifested by transient fever and depression. *Feline Practice*. May/June vol.21 no.3 pg. 13-20.
2. Cantrell MA, Grahn RA, Scott L, and Wichman HA. (2000). Isolation of markers from recently transposed LINE-1 retrotransposons. *Biotechniques*. Vol.29 no.6 pg. 1310-6. PMID: 11126134
 3. Jones CL, Grahn RA, Chien MB, Lyons LA, and London CA. (2004). Detection of c-kit mutations in canine mast cell tumors using fluorescent polyacrylamide gel electrophoresis. *Journal of Veterinary Diagnostic Investigations*. Mar;16 (2):95-100. PMID: 15053358
 4. Morris KV, Grahn RA, Looney DJ, and Pedersen NC. (2004). Characterization of a mobilization-competent simian immunodeficiency virus (SIV) vector containing a ribozyme against SIV Polymerase. *Journal of General Virology*. June 85(pt6):1489-96. PMID: 15166433
 5. Lyons LA, Biller DS, Erdman CA, Lipinski MJ, Young AE, Roe BA, Qin B, and Grahn RA (2004). Feline polycystic kidney disease mutation identified in PKD1. *The Journal of the American Society of Nephrology*. vol 15:2548-2555. PMID: 15466259
 6. Grahn RA, Biller DS, Young AE, Roe BA, Qin B, and Lyons LA. Genetic testing for feline polycystic kidney disease (PKD) (2004). *Animal Genetics* Dec;35 (6):503-4. PMID: 15566489
 7. Grahn RA, BonDurant RH, van Hoosear KA, Walker RL, and Lyons LA. (2005). An improved molecular assay for *Tritrichomonas foetus*. *Veterinary Parasitology* 127:33-41. PMID: 15619373
 8. Grahn RA, Lemesch BM, Millon LV, Matise T, Rogers QR, Morris JG, Fretwell N, Bailey SJ, Batt RM, and Lyons LA. (2005). Localizing the X-linked orange colour phenotype using feline resource families. *Animal Genetics* Feb;36 (1):67-70. PMID: 15670134
 9. Lyons LA, Imes DL, Rah H, and Grahn RA (2005). Tyrosinase mutations associated with Siamese and Burmese patterns in the domestic cat (*Felis catus*). *Animal Genetics* Apr;36(2) :119-126. PMID: 15771720
 10. Lyons LA, Foe IT, Rah H, and Grahn RA. (2005). Chocolate coated cats: TYRP1 mutations for brown color in domestic cats. *Mammalian Genome* May;16 (5):356-366. PMID: 16104383
 11. Grahn RA, Rhinehardt TA, Cantrell MA, and Wichman HA. (2005). Extinction of LINE-1 activity coincident with a major mammalian radiation in rodents. *Cytogenetic and Genome Research* 110(1-4):407-415. PMID: 16093693
 12. Rhinehart TA, Grahn RA, and Wichman HA. (2005). SINE extinction preceeded LINE extinction in sigmodontine rodents: Implications for retrotranspositional dynamics and mechanisms. *Cytogenetic and Genome Research* 110(1-4):416-425. PMID: 16093694
 13. Werner JA, Woo JC, Vernau WV, Graham PS, Grahn RA, Lyons LA, and Moore, PF. (2005). Characterization of feline immunoglobulin heavy chain variable region genes for the molecular diagnosis of B-cell neoplasia. *Veterinary Pathology*. Sep;42 (5):596-607. PMID: 16145206
 14. Imes DL, Geary LA, Grahn RA, and Lyons LA. (2006) Albinism in the domestic cat (*Felis catus*) is associated with a tyrosinase (TYR) mutation. *Animal Genetics*. Apr;37 (2):175-178. PMID: 16573534
 15. Lyons LA, Bailey SJ, Baysac KC, Byrns G, Erdman CA, Fretwell N, Froenicke L, Gazlay KW, Geary LA, Grahn JC, Grahn RA, Karere GM, Lipinski MJ, Rah H, Ruhe MT, and Bach LH. (2006). The Tabby cat locus maps to feline chromosome B1. *Animal Genetics*. Aug;37 (4) 383-6. PMID: 16879352

16. Bighignoli B, Niini T, Grahn RA, Pedersen NC, Millon LV, Polli M, Longeri M, and Lyons LA. (2007) Genetics of *cytidine-monophosphate-N-acetylneuraminic acid hydroxylase* (CMAH) and relationship to the domestic cat AB blood group. *BMC Genetics*. Jun 6;8:27. PMID: 17553163
17. Martin PT, Shelton GD, Dickinson PJ, Sturgess BK, Xu R, Lecouteur RA, Guo LT, Grahn RA, Lo HP, North KN, Malik R, Engvall E, and Lyons LA. (2008) Muscular dystrophy associated with alpha-dystroglycan deficiency in Sphynx and Devon Rex cats. *Neuromuscular Disorders*. Dec. 18 (12): 942-52. PMID: 18990577
18. Anderson NL, Grahn RA, Van Hoosear K, and Bondurant RH. (2009). Studies of trichomonad protozoa in free ranging songbirds: prevalence of Trichomonas gallinae in house finches (*Carpodacus mexicanus*) and corvids and a novel trichomonad in mockingbirds (*Mimus polyglottos*). *Vet Parasitol*. May 12;161 (3-4):178-86. PMID: 19278788
19. Kingsbury DD, Marks SL, Cave NJ, and Grahn RA. (2010). Identification of of Trichomonas foetus and Giardia spp infection in pedigree show cats in New Zealand. *New Zealand Veterinary Journal*. Feb;58 (1):6-10. PMID: 20200569
20. Grahn RA, Kurushima JD, Billings NC, Grahn JC, Halverson JL, Hammer E, Ho CK, Kun TJ, Levy JK, Lipinski MJ, Mwenda JM, Ozpinar H, Schuster RK, Shoorijeh SJ, Tarditi CR, Waly NE, Wictum EJ, and Lyons LA. (2011). Feline non-repetitive mitochondrial DNA control region database for forensic evidence. *Forensic Science International Genetics*. Jan;5 (1):33-42. PMID: 20457082
21. Schlafer DH, Valentine B, Fahnstock G, Froenicke L, Grahn RA, Lyons LA, and Meyers-Wallen VN. (2011). A Case of SRY-Positive 38, XY True Hermaphroditism (XY Sex Reversal) in a Cat. *Veterinary Pathology*. Jul;48(4):817-22. PMID:20861501.
22. Gandolfi B, Outerbridge CA, Beresford LG, Myers JA, Pimentel M, Alhaddad H, Grahn JC, Grahn RA, and Lyons LA. (2010) The naked truth: Sphynx and Devon Rex cat breed mutations in KRT71. *Mammalian Genome*. Oct;21 (9-10):509-15. PMID:22553308.
23. Tarditi CR, Grahn RA, Evans JJ, Kurushima JD, and Lyons LA. (2011). Mitochondrial DNA Sequencing of Cat Hair: An Informative Forensic Tool. *Journal of Forensic Science*. Jan;56 Suppl 1:S36-S46. PMID: 21077873.
24. Keuhner KA, Marks SL, Kass PH, Sauter-Louis C, Grahn RA, Barutzki D, and Hartmann K. (2011). Tritrichomonas foetus infection in purebred cats in Germany; prevalence of clinical signs and the role of coinfections with other enteroparasites. *Feline Medicine and Surgery*. Apr;13 (4); 251-8. PMID: 21288749.
25. York D, Higgins RJ, LeCouter RA, Wolfe AN, Grahn R, Olby N, Cambell M, and Dickinson PJ. (2011). TP53 Mutations in Canine Brain Tumors. *Veterinary Pathology*. Oct 15. PMID: 22002975.
26. Grahn RA, Ellis MD, Grahn JC, and Lyons LA. (2012). A novel CYP27B1 mutation causes a feline vitamin D-dependent Rickets type 1A. *Feline Medicine and Surgery*. Aug;14(8):587-590. PMID: 22553308.
27. Bach LH, Gandolfi, B., Grahn JC, Millon LV, Kent MS, Narfstrom K, Cole SA, Mullikin JC, Grahn RA, and Lyons LA. (2012). A high-resolution 15,000Rad radiation hybrid panel for the domestic cat. *Cytogenetics and Genome Research*. 2012;137 (1):7-14. PMID: 22777158.
28. Kurushima J., Ikram S, Knudsen J, Bleiberg E, Grahn RA, and Lyons LA. (2012) Cats of the Pharaohs: Genetic comparison of Egyptian cat mummies to their feline contemporaries. *Journal of Archaeological Science*. Oct;39 (10):3217-3223. PMID: 22923880.
29. Kinney ME, Wack RF, Grahn RA, and Lyons LA. (2012) Parthenogenesis in a Brazilian rainbow boa (*Epicrates cenchria cenchria*). *Zoo Biology*. 2012 Oct 19. PMID: 23171373.

30. Grahn RA, Grahn JC, Penedo MCT, Helps CR, and Lyons LA. (2012). Erythrocyte pyruvate kinase deficiency mutation identified in multiple breeds of domestic cats. *BMC Veterinary Research*. 2012 Oct 30;8 (1):207. PMID: 23110753.
31. Kurushima JD, Lipinski MJ, Gandolfi B, Froenicke L, Grahn JC, Grahn RA, and Lyons LA. (2013) Variation of cats under domestication: Genetic assignment of domestic cats to breeds and worldwide random bred populations. *Animal Genetics*. 2013 Jun;44 (3):311-24 (Epub 2012 Nov 22). PMID: 23171373.
32. Lambo CA, Grahn RA, Lyons LA, Bateman HI, Newsom J, and Swanson WF. (2012) Comparative fertility of freshly collected vs frozen-thawed semen with laparoscopic oviductal artificial insemination in domestic cats. *Reprod Domest Anim*. 2012 Dec;47 Suppl 6:284-8. PMID 23279520.
33. Alhaddad H, Kahn R, Grahn RA, Gandolfi B, Mullikin JC, Cole SA, Gruffydd-Jones TJ, Häggström J, Lohi H, Longeri M, and Lyons LA. (2013). Extent of Linkage Disequilibrium in the Domestic Cat, *Felis silvestris catus* and its breeds. *PLoS ONE*. 2013 Jan 7;8 (1). PMID: 23308248.
34. Conforti VA, Bateman HL, Schook MW, Newsom J, Lyons LA, Grahn RA, Deddens JA, and Swanson WF. (2013) Laparoscopic oviductal artificial insemination improves pregnancy success in exogenous gonadotropin-treated domestic cats as a model for endangered felids. *Biology of Reproduction*. Jul 5;89 (1):4. PMID: 23699391.
35. Grahn RA, Huang TI, and Lyons LA. (2013) Impact of allogrooming in domestic cats (*Felis silvestris catus*) on mitochondrial DNA profiling of shed hairs. *Open Forensic Science Journal*. 6: 12-19.
36. Swanson WF, Newsom J, Lyons LA, Grahn RA, and Bateman HL. (2013) 58 Ovarian down-regulation with oral progestin for fixed-time laparoscopic oviductal artificial insemination with freshly collected and frozen-thawed spermatozoa in domestic cats. *Reproduction, Fertility and Development* 26(1) 143-143.
37. Alhaddad H, Gandolfi B, Grahn RA, Rah HC, Peterson CB, Maggs DJ, Good KL, Pedersen NC, and Lyons LA. (2014) Genome-wide association and linkage analyses localize a progressive retinal atrophy locus in Persian cats. *Mammalian Genome*. Aug;25 (7-8):354-62. PMID: 24777202.
38. Lyons LA, Grahn RA, Kun TJ, Netzel LR, Wictum EE, and Halverson J. (2014) Mitochondrial DNA Acceptance of domestic cat mitochondrial DNA in a criminal proceeding. *Forensic Science International Genetics*. Nov;13:61-7 PMID: 25086413.
39. Grahn RA, Alhaddad H, Alves PC, Randi E, Waly NE, and Lyons LA. (2014) Feline mitochondrial DNA sampling for forensic analysis: When enough is enough! *Forensic Science International Genetics*. Nov 29;16C:52-57. PMID: 25531059.
40. Malik R, Musca FJ, Gunew MN, Menrath VH, Simpson C, Culvenor J, Grahn RA, Helps C, Lyons LA, and Gandolfi B. (2015) Periodic hypokalaemic polymyopathy in Burmese and closely related cats. A review including the latest genetic data. *Journal of Feline Medicine and Surgery*. May;17 (5):417-426. PMID: 25896241.
41. Ofri R, Reilly CM, Maggs DJ, FitzGerald PG, Shilo-Benjamini Y, Good KL, Grahn RA, Splawski DD, and Lyons LA. (2015) Characterization of a novel, early-onset, autosomal recessive, progressive retinal degeneration in Bengal cats. *Investigative Ophthalmology and Visual Science*. Aug v.56:5299-5308. PMID: 2628614.
42. Gandolfi B, Grahn RA, Creighton EK, Williams DC, Dickinson PJ, Sturges BK, Guo LT, Shelton GD, Leegwater PA, Longeri M, Malik R, and Lyons LA. (2015) COLQ variant associated with Devon Rex and Sphynx feline hereditary myopathy. *Animal Genetics*. Dec;46 (6):711-5. Epub 2015 Sep 16. PMID: 26374066.

43. Lyons LA, Erdman CA, Grahn RA, Hamilton MJ, Carter MJ, Helps CR, Alhaddad H, and Gandolfi B. (2016) Aristaleless-Like Homeobox protein 1 (ALX1) variant associated with craniofacial structure and frontonasal dysplasia in Burmese cats. *Developmental Biology*. Dec 1. pii: S0012-1606(15)30223-2. [Epub ahead of print] PMID: 26610632.
44. Schjaerff M, Keller SM, Fass J, Froenicke L, Grahn RA, Lyons L, Affolter VK, Kristensen AT, and Moore PF. (2016) Refinement of the canine CD1 locus topology and investigation of antibody binding to recombinant canine CD1 isoforms. *Immunogenetics*. Mar;68 (3):191-204 PMID: 26687789.
45. Lyons LA, Creighton EK, Alhaddad H, Beale HC, Grahn RA, Rah H, Maggs DJ, Helps CR, and Gandolfi B. (2016) Whole genome sequencing in cats identifies new models for blindness in AIPL1 and somite segmentation in HES7. *BMC Genomics*. Mar 31;17 (1):265. PMID 27030474.
46. Brooks A, Creighton EK, Gandolfi B, Khan R, Grahn RA, and Lyons LA. (2016) SNP miniplexes for individual identification of random-bred domestic cats. *Journal of Forensic Sciences*. May;61 (3):594-606. PMID 27122395.
47. Gandolfi B, Grahn RA, Gustafson NA, Proverbio D, Spada E, Adhikari B, Cheng J, Andrews G, Lyons LA, and Helps CR. (2016) A novel variant in CMAH is associated with blood type AB in Ragdoll cats. *PLoS One*. May 12;11 (5) PMID 27172395.
48. Li G, Hillier LW, Grahn R, Zimin AV, David VA, Menotti-Raymond M, Middleton R, Hannah S, Hendrickson S, Makunin A, O'Brien SJ, Minx P, Wilson RK, Lyons LA, Warren WC, and Murphy WJ. (2016) A high-resolution SNP array-based linkage map anchors a new domestic cat draft genome assembly and provides detailed patterns of recombination. *G3 (Bethesda)* Mar 30. PMID 27172201.
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Robert A. Grahn, Jennifer C. Grahn, Jennifer R. Colangelo, Julia Malvick. (2019) A novel MLPH mutation results in a third coat color dilution variant in dogs. *10th International Conference on Canine and Feline Genetics and Genomics*. Bern, Switzerland.

Allyson Ripley, Cecilia Penedo, Robert Grahn, Elena Martinez de Andino, Stephanie Walbornn, Rosanna Serafini, Charles Love, Katrin Hinrichs. (2018) Aspiration of yolk sac fluid from the early pregnant mare for fetal genotyping. *XIIth International Symposium on Equine Reproduction*. Cambridge, UK.

Robert A. Grahn, Jennifer C. Grahn, M. Cecilia T. Penedo. (2017). Genetic variation at the K locus and resultant phenotypes. *International Society of Animal Genetics*. Dublin, Ireland.

Christina D. Lindquist and Robert A. Grahn. (2017) Mitochondrial haplotyping in dogs and cats. (2017) *Society for Wildlife Forensic Science*. Edinburgh, Scotland.

Robert A. Grahn and Christina D. Lindquist. (2017) What is that meat in the freezer? A wildlife identification panel. *Society for Wildlife Forensic Science*. Edinburgh, Scotland.

Zachary Lounsberry, Robert Grahn, Cecilia Penedo, Steve Fain, Benjamin N. Sacks. (2017) Genotyping-by-sequencing helps improve detection of hybridization between domestic dogs and wild *Canis*. *The Western Section of Wildlife Society*. Reno, Nevada.

Robert Grahn (2017). Inherited Diseases and Genetic Testing in Dogs. **Lecture** *UC Davis Winter Conference*. Davis, California.

Maura Mack, Elizabeth Kowalski, Robert Grahn, Deneli Bras, Maria CT Penedo, Rebecca Bellone. (2017). Two mutations in Solute Carrier Family 24 Member 5 cause the “tiger eye” iris pigmentation in Puerto Rican Paso Fino Horses. *XXV Annual Plant and Animal Genome Conference*. San Diego, California.

RA Grahn, CD Lindquist, and CM Penedo. (2016). Domestic Animal Forensics at the UC Davis Veterinary Genetics Laboratory. **Lecture** *International Society of Animal Genetics: Forensics Workshop*, Salt Lake City, Utah.

Robert Grahn (2016). Genetic Diversity of Dog Breeds. **Invited Lecture** *Flat-coated Retriever Society of America*. Sacramento California.

Robert Grahn. (2016). DNA verification of Challenged Toxicology Test Results. **Invited Lecture** *Association of Racing Commissioners International*. New Orleans, Louisiana.

Abdi Mona, H. Alhaddad, B. Gandolfi, R. Grahn, and L.A. Lyons. (2016). Degree of Bengalness: A measure of the genomic contribution of Asian Leopard Cats into Bengal breed cats. *XXIV Annual Plant and Animal Genome Conference*. San Diego, California.

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J. Qiu, V. Basnayake, E. B. Simpson, R.A. Grahn, N. Gustafson and L. A. Lyons. 2014. Evaluation of single nucleotide polymorphism (SNP) markers for feline parentage analysis. *34th International Society for Animal Genetics*. Xi'an, China.

Grahn, RA, Gandolfi, B, Malik, R, Jones, B, Prinzenberg, E-M, Erhardt, G, Gruffydd-Jones, TJ, Lyons, LA. 2012 Identification of the gene for Burmese autosomal recessive hypokalemic polymyopathy by genome-wide association study. **Invited lecture**. *2012 ACVIM Forum*-New Orleans, LA.

Grahn, RA, Grahn, JC, Penedo, MC, Lyons, LA. 2012. Erythrocyte Pyruvate Kinase Deficiency Identified in Multiple breeds of Domestic Cats. *XX Annual Plant and Animal Genome Conference*. San Diego, California.

Alhaddad, H, Cortes, A, Gandolfi, B, Grahn, R, Lyons L. 2011. Linkage disequilibrium in the domestic cat: A look at the breeding past and eye on the future! *XIX Annual Plant and Animal Genome Conference*. San Diego, California.

Valeria A. Conforti, Helen L. Bateman, Mandi M. Vick, Jackie Newsom, Leslie A. Lyons, Robert A. Grahn, James A. Deddens, and William F. Swanson. 2011. Artificial Insemination with Low Sperm Numbers in Domestic Cats. *44th SSR Annual Meeting*. Portland, Oregon.

Robert A. Grahn, Melanie Ellis, Jennifer C. Grahn, Leslie A. Lyons. 2010. No bones about it! A novel *CYP27B1* mutation results in feline Vitamin D-Dependent Rickets Type I (VDDR-1). *Fifth International Conference for Advances in Canine and Feline Genetics*. Baltimore Maryland.

Barbara Bighignoli, Tirri Niini, Robert A. Grahn, Niels C. Pedersen, Michele Polli, Maria Longeri and Leslie A. Lyons. 2006. Domestic Cat AB Blood Type Mutations Identified in *Cytidine Monophospho-N-acetylneurameric Acid Hydroxylase (CMAH)*. *30th Conference of the International Society of Animal Genetics*, Porto Seguro, Brazil.

Grahn, R.A., Dickinson, P.J., Leutenegger, C.M., Shelton, G.D. and Lyons, L.A. 2006 Dystrophin associated glycoprotein 1 (DAG1) evaluation in cats with congenital muscular dystrophy. *Third International Conference for Advances in Canine and Feline Genetics*, Davis, California.

Grahn, R.A., BonDurant, R.H., van Hoosear, K.A., Walker, R.L. and Lyons, L.A. 2005. An improved molecular assay for *Tritrichomonas foetus* detection. *XIII Annual Plant and Animal Genome Conference*. San Diego, California.

Lyons, L.A., Erdman, C.A., Foe, I.T., Heintzelman, L., Imes, D.L., Lewis, G.M., Lipinski, M.J., Podzalny, E., Wrights, J. and Grahn, R.A. 2004 Genetic tests for domestic cats. *29th Conference of the International Society of Animal Genetics*, Tokyo, Japan.

Ian T. Foe, Robert A. Grahn and Leslie A. Lyons. 2003. Chocolate coated cats: Tyrosinase related protein 1 and its effect on feline coat color. *Tufts' Canine & Feline Breeding and Genetics Conference*, Tufts University, Cummings School of Veterinary Medicine, Grafton, Massachusetts.

Donna L. Imes, Amy E. Young, Robert A. Grahn and Leslie A. Lyons. 2003. Get to the Point: Identifying Albinism Mutations in Cats. *Tufts' Canine & Feline Breeding and Genetics Conference*, Tufts University, Cummings School of Veterinary Medicine, Grafton, Massachusetts.

Robert A. Grahn, Lee V. Millon and Leslie A. Lyons. 2002. MC1R on the X-chromosome in the domestic cat? Not! *X Annual Plant and Animal Genome Conference*. San Diego, California.

Roberts, H.R., Lyons, L.A., Grahn, R.A. and Biller, D. 2002 Molecular and pedigree analysis of polycystic kidney disease in Persian cats *X Annual Plant and Animal Genome Conference*. San Diego, California.

Lyons, L.A., Young, A.E., Grahn, R.A. and Roberts, H.R. 2002 Genetic diversity of the domestic cats breeds. *28th Conference of the International Society of Animal Genetics*, Goettingen, Germany.

Robert A. Grahn, Willy Hsu and Leslie A. Lyons. 2001. The rabbit test: Using denaturing HPLC to identify allelic variation in the AX and IIIVO strains of domestic rabbits. *IX Annual Plant and Animal Genome Conference*. San Diego, California.

Robert A. Grahn and Leslie A. Lyons. 2001. Human-derived microsatellites for the characterization and production of genotype specific Rhesus Macaques. *IX Annual Plant and Animal Genome Conference*. San Diego, California.

Leslie A. Lyons, Robert A. Grahn, Mary Mattapallil and Niels C. Pedersen. 2001. Genetic analysis of domestic cat breeds. *IX Annual Plant and Animal Genome Conference*. San Diego, California.

London, Cheryl, May Chien and Rob Grahn. 2000. Investigating the role of mutations in the proto-oncogene *c-KIT* in canine mast cell tumors. *Veterinary Cancer Society Conference*. Pacific Grove, California.

Grahn, R. A. and Wichman H.A. 1999. (Oral Presentation) Different techniques used to isolate LINE-1 transposable elements bias data sets and affect inferred phylogenies. *1999 Annual Meeting of ASN/SSB/SSE*. Madison, Wisconsin.

Grahn, R. A. Casavant, N.C. and Wichman H.A. 1998. (Oral Presentation) Extinction of the LINE-1 transposable element family in the Oryzomyini tribe. *1998 Annual meeting of ASN/SSB/SSE*. Vancouver, Canada.

Grahn, R. A. and Wichman H.A. 1996. Characterization of LINE-1 transposable elements in *Microtus arvalis*. *Fourth International Annual Meeting of the Society for Molecular Biology and Evolution*. Tucson, Arizona.

Teaching/Mentorship

Students

Leilani Nguyen. Masters of Forensic Science 2020

Thesis Title: Evaluation of variables affecting the success of typing shed dog hair using direct PCR

Jocelyn Tanaka. Masters of Science 2019

Thesis Title: Investigation of coat color traits in equids

Vamsi Thiriveedhi. Masters of Forensic Science 2019

Thesis Title: Direct PCR amplification of nuclear DNA from shed dog hair using DogFiler

William Chan. Masters of Forensic Science 2019

Thesis Title: Evaluations of substrate and sampling methodology on the efficacy of obtaining primary trace canine mitochondrial DNA

Taylor Tyler. Masters of Forensic Science 2016.

Thesis Title: Mitotype frequencies of the hypervariable region of canine mitochondrial DNA

Student Interns

Jennifer Colangelo 2018

Savannah Tobin 2016-2017

Elizabeth Esdaile 2016

Cherylin Yee 2015-16

Courses

Plagues: Past, Present and Future

Freshman Seminar

Fall 2006, Spring 2007, Fall 2007, Winter 2008, Spring 2009, Winter 2014

Introductory Biology for Non-Majors, Solano Community College 2013

The Foundations of Biology, Cosumnes River College 2016-18

Biology of Organisms, Cosumnes River, 2016-2023

General Biology, Cosumnes River College 2016-present

Anatomy and Physiology, Cosumnes River College 2022-present

Extending Knowledge

National Geographic Explorer. 2008. Science of Cats.

Weird True and Freaky. 2008. Legendary Creatures.

Purina Pro Club. 2009. PKD Genetic Research Focuses on Rapid-progressing Form of Disease

Weird True and Freaky. 2010. Little Animals Big World

Weird True and Freaky. 2010. Bizarre Looking Cats

Patent

US patent # 7,141,376. Carrier tests for polycystic kidney disease in the cat